

REMARKS

In this Office Action, the Examiner has rejected claims 12, 13, 16, 17, and 19 under § 102(b) as being anticipated by Kutsuzawa et al., U.S. Patent No. 5,972,426, and rejected claim 20 under § 103(a) as being unpatentable over Kutsuzawa et al. in view of van Brederode et al., U.S. Patent No. 3,981,957. Claims 14, 15, and 18 are indicated as reciting allowable subject matter. Claims 21-27 stand allowed.

In this Amendment, Applicant has not amended or canceled any of the previously presented claims and has added new claims 28-32.

Favorable reconsideration and allowance of this application is respectfully requested in light of the remarks that follow.

Independent Claim 12

Independent claim 12 stands rejected under 35 U.S.C. § 102(b) as being anticipated by Kutsuzawa, U.S. Patent Number 5,972,426. Applicant hereby submits that claim 12 is allowable over the Kutsuzawa reference without amendment.

Under 35 USC §102(b), a claim is anticipated only if each and every claim limitation is disclosed in a single reference. Applicant respectfully submits that the Kutsuzawa reference fails to disclose, teach or even suggest a nozzle discharge aperture that includes "a pattern of discrete discharge holes debouching into a front surface of the nozzle and configured such that the coating material is discharged from the holes in separate strings" as is recited in claim 12. In addition, the Kutsuzawa reference further fails to disclose, teach or suggest "impinging the separate strings of the coating material on the object," and thereafter "fusing the impinged separate strings of the coating material together on the object to form a continuous strip of the coating material."

The Kutsuzawa reference fails to disclose a nozzle configured to discharge coating solution from the passages 9 in "separate strings" and fails to disclose that the coating solution is not discharged in "separate strings" in operation of the nozzle, which is required by claim 12. In fact, the Kutsuzawa reference nowhere discloses, teaches or even suggests that coating solution is discharged from the passages 9 in "separate strings," as is required by claim 12. Since

Kutsuzawa fails to disclose discharging coating solution from the passages 9 of the nozzle 4 in "separate strings," it logically follows that the Kutsuzawa reference also fails to disclose "impinging the separate strings of the coating material on the object," and thereafter "fusing the impinged separate strings of the coating material together on the object to form a continuous strip of the coating material."

As is noted in the Description of the Relevant Art section of Kutsuzawa, nozzles of the type disclosed in Kutsuzawa are typically located close to the surface of the object being coated and drop the coating solution onto the object being coated. Indeed, Fig. 1 of Kutsuzawa shows that the nozzle 4 is located extremely close to the object, namely substrate W, being coated with coating solution Q. Further consistent with this, Kutsuzawa discloses that the coating solution is discharged from the nozzle 4 at relatively low discharge pressures that range from between 0.1 to 0.5 kg/cm². When it is taken into consideration that the nozzle 4 disclosed in Kutsuzawa is located very close to the substrate and discharges coating solution at such a low pressure, Applicant respectfully submits that the coating solution is discharged from the passages 9 of the nozzle 4 at too low of a pressure to form "separate strings."

The Kutsuzawa reference fails to disclose these claim limitations for yet another reason. The Kutsuzawa reference discloses that coating solution from an internal coating solution reservoir 6 is communicated through the passages 9 to a coating solution holder 8, which holds the coating solution preventing it from falling off as droplets. *See, e.g.,* Kutsuzawa, col. 5, lines 4-12, col. 6, lines 56-67, col. 7, lines 1-5 (coating solution holder 8 holds "the coating solution supplied thereto.") and the Abstract (coating solution holder "for holding a coating solution against falling off as droplets"). Since Kutsuzawa discloses that the function of the coating solution holder 8 is to hold the coating solution communicated from the passages 9, it logically follows that coating solution being held by the coating solution holder 8 cannot also be discharged in "separate strings" from passages 9.

Finally, Kutsuzawa teaches away from the claimed invention. Since the Kutsuzawa reference discloses that it is undesirable for coating solution to fall as separate drops onto the substrate, Applicant submits that the reference thereby also teaches against coating solution

discharged from the passages 9 from being separately done so, such as is the case where "separate strings" are discharged.

Kutsuzawa also fails to disclose a method where the nozzle "where coating material is discharged from the [discharge] holes in separate strings." Rather, Kutsuzawa discloses a method where coating solution discharged from the passages 9 of the nozzle 4 is communicated to the coating solution holder 8, which is located between the object, i.e., substrate W, and the nozzle passages 9. As previously mentioned, Kutsuzawa discloses that the nozzle 4 is configured with a coating solution holder 8 to hold the coating solution to prevent it from falling off as droplets. As a result, it is logically impossible for coating solution to be held by the coating solution holder 8 and at the same time be discharged in discrete strings from the nozzle passages 9 such that they impinge against the object being coated.

Even if it is assumed for the purpose of argument that coating solution is somehow actually discharged from nozzle passages 9 in discrete strings, the Kutsuzawa reference fails to disclose that they actually impinge upon the object being coated, as is required by claim 12. At best, the Kutsuzawa reference discloses a nozzle 4 that has a plurality of passages 9 through which coating solution is discharged at a low pressure into a coating solution holder 8 located in very close proximity over the object, i.e., substrate W, being coated such that coating solution held by the coating solution holder 8 helps ensure more uniform coating of the object. Coating solution held by the coating solution holder 8 obstructs coating solution discharged from the passages 9 from impinging directly against the object being coated.

In addition, Applicant submits that the low pressures at which coating solution is discharged from the nozzle passages 9 of the nozzle 4 disclosed in Kutsuzawa would not result in discrete strings of coating solution impinging against the object being coated. In fact, Applicant submits that the combination of the low coating solution pressures disclosed in Kutsuzawa and the inherent surface tension present in the coating solution would result in the coating solution discharged from the nozzle passages 9 essentially dribbling from the nozzle passages 9.

Even if it is assumed for the purpose of argument that coating solution discharged from nozzle passages 9 actually somehow does impinge against the object being coated in discrete

strings, the Kutsuzawa reference fails to disclose that the coating solution thereafter fuses together on the object being coated "to form a continuous strip of the coating material," as is required by claim 12. Instead, the Kutsuzawa reference discloses that the object being coated is located on a circular inner cup 2 that must be rotated after coating solution has been applied by the nozzle 4 to spread the coating solution uniformly over the object. *See, e.g.,* col. 4, lines 36-41 of the Kutsuzawa reference. Thus, the Kutsuzawa reference teaches that application of the coating solution with the nozzle 4 alone is insufficient to ensure that "a continuous strip of the coating material" is formed on the object being coated without thereafter also rotating the coated object.

For at least these reasons, is believed that independent claim 12 is presented in condition for allowance and its allowance is respectfully requested.

Dependent Claim 13

Dependent claim 13 also stands rejected under 35 U.S.C. § 102(b) as being anticipated by Kutsuzawa, U.S. Patent Number 5,972,426. Applicant hereby submits that claim 13 is allowable over the Kutsuzawa reference without amendment as it depends from independent claim 12, a claim believed to be presented in condition for allowance.

Independent Claim 16

Independent claim 16 also stands rejected under 35 U.S.C. § 102(b) as being anticipated by Kutsuzawa, U.S. Patent Number 5,972,426. Applicant hereby submits that claim 16 is also allowable over the Kutsuzawa reference without amendment.

Under 35 USC §102(b), a claim is anticipated only if each and every claim limitation is disclosed in a single reference. Applicant respectfully submits that the Kutsuzawa reference fails to disclose, teach or even suggest a nozzle that includes "a tip having a plurality of discrete coating material discharge holes formed therein," and the holes "being dimensioned and positioned relative to one another such that the coating material is discharged therefrom and impinges upon the object in discrete strings and thereafter fuses together on the object to form a continuous strip of the coating material."

The term "tip" is defined as "the extreme end of something; especially something pointed." *See, e.g.,* the definition of "tip" at www.dictionary.com. While the Kutsuzawa reference discloses a nozzle 4 having a plurality of passages 9, the passages 9 are not located at the tip of the nozzle 4, as is required by claim 16. Instead, Kutsuzawa discloses that the passages 9 are located in a part of the nozzle 4 that is recessed from the nozzle tip by coating solution holder 8.

Kutsuzawa also fails to disclose a nozzle that is "dimensioned and positioned relative to one another such that the coating material is discharged therefrom and impinges upon the object in discrete strings," as is also required by claim 16. Rather, Kutsuzawa discloses that coating solution discharged from the passages 9 of the nozzle 4 is communicated to the coating solution holder 8, which is a channel in the end of the nozzle 4 that is located between the object, i.e., substrate W, and the nozzle passages 9. Kutsuzawa discloses that the nozzle 4 is configured with a coating solution holder 8 to hold the coating solution to prevent it from falling off as droplets. As a result, it is logically impossible for coating solution to be held by the coating solution holder 8 and at the same time be discharged in discrete strings from the nozzle passages 9 such that they impinge against the object being coated.

Even if it is assumed for the purpose of argument that coating solution is somehow actually discharged from nozzle passages 9 in discrete strings, the Kutsuzawa reference fails to disclose that they actually impinge upon the object being coated, as is required by claim 16. At best, the Kutsuzawa reference discloses a nozzle 4 that has a plurality of passages 9 through which coating solution is discharged at a low pressure into a coating solution holder 8 located in very close proximity over the object, i.e., substrate W, being coated such that coating solution held by the coating solution holder 8 helps ensure more uniform coating of the object. Coating solution held by the coating solution holder 8 obstructs coating solution discharged from the passages 9 from impinging directly against the object being coated.

In addition, Applicant submits that the low pressures at which coating solution is discharged from the nozzle passages 9 of the nozzle 4 disclosed in Kutsuzawa would not result in discrete strings of coating solution impinging against the object being coated. In fact, Applicant

submits that the combination of the low coating solution pressures disclosed in Kutsuzawa and the inherent surface tension present in the coating solution would result in the coating solution discharged from the nozzle passages 9 to essentially dribble from the nozzle passages 9.

Even if it is assumed for the purpose of argument that coating solution discharged from nozzle passages 9 actually somehow impinges against the object being coated in discrete strings, the Kutsuzawa reference fails to disclose that the coating solution thereafter fuses together on the object being coated "to form a continuous strip of the coating material," as is required by claim 16. Instead, the Kutsuzawa reference discloses that the object being coated is located on a circular inner cup 2 that must be rotated after coating solution has been applied by the nozzle 4 to spread the coating solution uniformly over the object. *See*, e.g., col. 4, lines 36-41 of the Kutsuzawa reference. Thus, the Kutsuzawa reference teaches that application of the coating solution with the nozzle 4 alone is insufficient to ensure that "a continuous strip of the coating material" is formed on the object being coated without thereafter also rotating the coated object.

For at least these reasons, is believed that independent claim 16 is presented in condition for allowance and its allowance is respectfully requested.

Dependent Claims 17 and 19

Dependent claims 17 and 19 also stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kutsuzawa, U.S. Patent Number 5,972,426. Applicant hereby submits that claims 17 and 19 are each allowable over the Kutsuzawa reference without amendment as each depends from independent claim 16, a claim believed to be presented in condition for allowance.

Dependent Claim 20

Independent claim 20 also stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Kutsuzawa, U.S. Patent Number 5,972,426, in view of van Brederode, U.S. Patent Number 3,981,957. Applicant hereby submits that claim 20 is presented in condition for allowance because this claim depends from independent claim 16, a claim believed to be presented in condition for allowance.

Newly Presented Claims

Independent claim 28 is believed to be in condition for allowance. Neither Kutsuzawa nor van Brederode, alone or in combination with each other or any other reference of record, disclose, teach or suggest a method for the spray extrusion of a low viscosity coating material that includes (1) an attachment fixture, such as for attachment to a robot or the like, (2) a tip at the free end of the nozzle in which a plurality of pairs, i.e., at least three, discharge holes are formed, and (3) discharging coating material from each one of the plurality of pairs of discharge holes such that a separate stream of coating material comes from each one of the discharge holes with the streams of coating material not being joined in the air.

Claim 29 depends from independent claim 28 and is believed presented in condition for allowance for at least the same reasons that claim 28 is believed presented in condition for allowance. In addition, neither Kutsuzawa nor van Brederode, alone or in combination with each other or any other reference of record, disclose, teach or suggest the method of claim 28 where attachment fixture is integrally formed of the nozzle body.

Independent claim 30 is believed to be in condition for allowance. Neither Kutsuzawa nor van Brederode, alone or in combination with each other or any other reference of record, disclose, teach or suggest a method for the spray extrusion of a low viscosity coating material that includes (1) a nozzle capable of being located below the object being coated, (2) a tip at the free end of the nozzle in which a plurality of pairs, i.e., at least three, discharge holes are formed, and (3) discharging coating material from each one of the plurality of pairs of discharge holes such that a separate stream of coating material comes from each one of the discharge holes with the streams of coating material not being joined in the air. The nozzle disclosed in Kutsuzawa is simply not capable of being operated from a location below the object being coated because the low pressures at which coating solution is discharged from nozzle passages 9 would not be able to discharge coating solution to reach the object.

Claim 31 depends from independent claim 30 and is believed presented in condition for allowance for at least the same reasons that claim 30 is believed presented in condition for allowance. In addition, neither Kutsuzawa nor van Brederode, alone or in combination with each other or any other reference of record, disclose, teach or suggest the method of claim 30 where the discharge holes have a combined discharge area of about 10-20% of the area of a nozzle having an uninterrupted discharge slot of a corresponding extent.

Claim 32 depends from independent claim 30 and is believed presented in condition for allowance for at least the same reasons that claim 30 is believed presented in condition for allowance. In addition, neither Kutsuzawa nor van Brederode, alone or in combination with each other or any other reference of record, disclose, teach or suggest the method of claim 30 where the nozzle is located below the object with the discharge holes of the nozzle discharging coating material from below the object toward the object.

Conclusion

All of the claims presented herein are believed to define patentable subject matter and to be in proper form for allowance. New claims 28-32 are also believed to be in condition for allowance. Therefore, consideration and allowance of claims 12-32 are respectfully requested.

Enclosed is a check in the amount of \$286 for which \$110 is allotted for a one month extension of time from October 2, 2004 to November 2, 2004 and which \$176 is allotted for the addition of two additional independent claims over the number of independent claims previously presented. In addition, the Commissioner is authorized to charge payment of any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1170.

The Examiner is encouraged to contact the undersigned if the Examiner believes it would expedite matters.

Respectfully submitted,



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